HIGH SENSITIVITY MECHANICAL RESONANT SENSOR

Abstract of the Disclosure

A system and method for detecting mass based on a frequency differential of a resonating micromachined structure, such as a cantilever beam. A high aspect ratio cantilever beam is coated with an immobilized binding partner that couples to a predetermined cell or molecule. A first resonant frequency is determined for the cantilever having the immobilized binding partner. Upon exposure of the cantilever to a solution that binds with the binding partner, the mass of the cantilever beam increases. A second resonant frequency is determined and the differential resonant frequency provides the basis for detecting the target cell or molecule. The cantilever may be driven externally or by ambient noise. The frequency response of the beam can be determined optically using reflected light and two photodetectors or by interference using a single photodetector.